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ABSTRACT

This vocational instructional module on common terms used in the study of electricity is one of eight such modules designed to assist recently arrived Arab students, limited in English proficiency (LEP), in critical instructional areas in a comprehensive high school. Goal stated for this module is for the student enrolled in electronics courses to know how to use the most common terms in the study of electricity. Each module consists of these parts: title; program goal and performance objectives; a pronunciation key; a language page which offers the pronunciation, definition, and usage of key terms in English and in Arabic; a pretest; bilingual (English and Arabic) language (vocabulary and usage) activities; evaluation; pretest and activity answer sheets; and a list of supplementary materials and their location. For each of the three activities in this module the objective, a list of materials needed, procedure, and evaluation are provided in addition to the necessary activity sheets or pages. (YLB)

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FORDSON BILINGUAL DEMONSTRATION PROJECT

برنامج فوردسون النموذجي الثنائي اللغة

ED261174

TERMS FOR BASIC ELECTRICITY

المفردات الاساسية للكهرباء

CE042319

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ABOUT THE **PROJECT**

The Fordson Arabic Bilingual Demonstration Project is designed to assist recently arrived Arab students, limited in English proficiency (LEP), to adapt to a large and comprehensive high school. The project consists of academic and vocational instructional modules, reading services to teachers and students, bilingual aide and resource services, computer and television modules, staff development activities, and home-community liaison.

ABOUT THE INSTRUCTIONAL **MODULES**

The modules were designed to assist LEP students in critical instructional areas throughout the school curriculum. These areas of focus were determined by a needs survey of the entire Fordson school community. Each module consists of seven parts: title, objectives, pretest, language (vocabulary and usage) activities, evaluation, and supplementary materials. Modules were translated, duplicated, and field tested.

ABOUT THE **AUTHOR**

Roger St. John did his undergraduate work at Northern Michigan University and his graduate training at the University of Michigan. Roger has taught Electronics at Fordson High School and Henry Ford Community College for 18 years. Rick Topolewski provided additional technical assistance in the construction of this module. The concepts developed in this instructional module are considered essential for beginning limited English proficiency students in Electronics.

FORDSON BILINGUAL DEMONSTRATION CENTER

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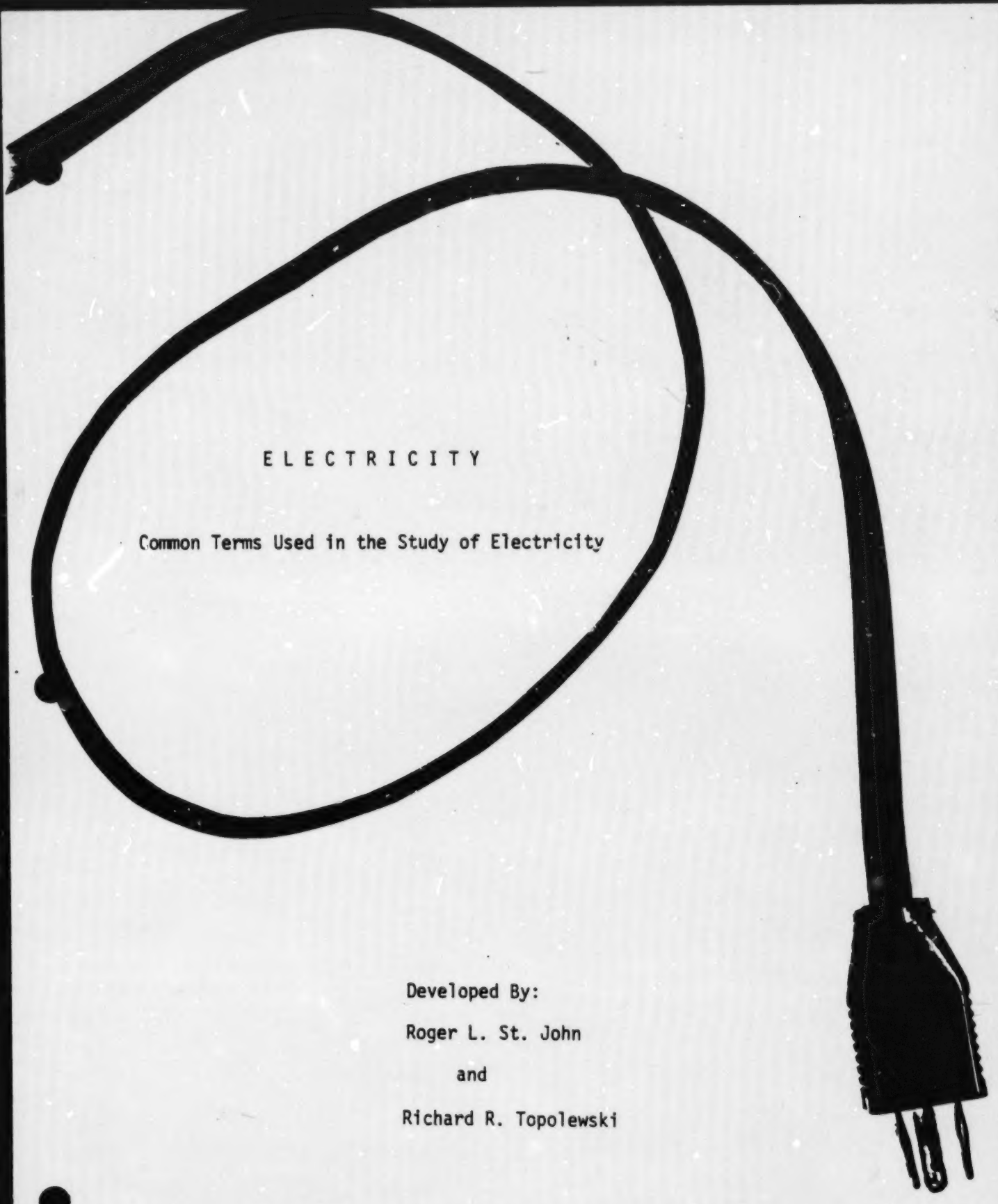

E L E C T R I C I T Y

Common Terms Used in the Study of Electricity

Developed By:

Roger L. St. John

and

Richard R. Topolewski

This bilingual module has been developed to assist limited English proficiency students to know how to use the most common terms in the study of electricity. This unit is designed for students enrolled in electronics courses.

GENERAL OBJECTIVE:

The student will:

know how to use the most common terms in the study of electricity.

SPECIFIC OBJECTIVES:

The student will:

1. know the meaning of the most common terms used in electricity in the first two weeks of class well enough to understand the lessons that will follow;
2. use the electrical terms correctly in verbal and written communication in the classroom within the first two weeks attaining a proficiency (as observed by the teacher) to allow them to succeed in further lessons;
3. correctly pronounce all the terms so they can be understood.

PRETEST اختبار تمهيدي

Match the letters A through D to the numbers 1 through 4.

لائم الحروف من (أ) الى (د) مع الاعداد من (١) الى (٤) .

_____1. voltage ١ ـ جهد

_____2. current ٢ ـ تيار

_____3. resistance ٣ ـ مقاومة

_____4. power ٤ ـ قدرة

A. the flow of electrons أ ـ دفق الكهيربات

B. voltage and current together ب ـ الجهد والتيار معا"

C. opposition جـ ـ التعارض

D. electrical pressure, potential difference د ـ الضغط الكهربائي ،فرق الجهد (الكهربائي)

Match the letters E through H to the numbers 5 through 8.

لائم الحروف من (هـ) الى (ح) مع الاعداد من (٥) الى (٨) .

_____5. ampere ٥ ـ أمبير

_____6. volt ٦ ـ فلط

_____7. ohm ٧ ـ أوم

_____8. watt ٨ ـ واط

E. unit of measure for voltage هـ ـ وحدة قياس الجهد

F. unit of measure for current و ـ وحدة قياس التيار

G. unit of measure for resistance ز ـ وحدة قياس المقاومة

H. unit of measure for power ح ـ وحدة قياس القدرة

Go on to next page. أمض الى الصفحة التالية .

PRETEST (continued) اختبار تمهيدي (يتبع)

Match the letters I through L to the numbers 9 through 12.

لائم الحروف من (ط) الى (ل) مع الاعداد من (٩) الى (١٢) .

_____9. electron ٩ – كهيرب

_____10. proton ١٠ – بروتون (أويل)

_____11. atom ١١ – ذرة

_____12. neutrons ١٢ – نيوترونات – مفرده نيوترون

I. smallest particle of an element ط – اصغر جزيء في العنصر

J. negative particle ي – جزيء سالب الشحنة

K. neutral particle ك – جزيء غيرمشحون

L. positive particle ل – جزيء موجب الشحنة

Match the letters M through P to the numbers 13 through 16.

لائم الحروف من (م) الى (ع) مع الاعداد من (١٣) الى (١٦)

_____13. molecules ١٣ – جسيم (جزيء)

_____14. elements ١٤ – عناصر

_____15. static ١٥ – ساكن – إستاتي

_____16. coulomb ١٦ – كولوم – امبير ثانية

M. smallest particle of a material م – اصغر جزيء في المادة

N. basic substance of all material ع – الجوهر الاساسي لكل المواد

O. not moving ف – لا متحرك

P. a large number of electrons س – عدد كبير من الكهيربات

PRONUNCIATION KEY

/a/ as in Adam

/ā/ as in cake

/e/ as in let

/ē/ as in meet

/i/ as in sit

/ī/ as in ice cream

/o/ as in hot

/ō/ as in Coke

/u/ as in Seven Up

/ū/ as in blue

/b/ as in boy

c equals /s/ as in cents (10¢)
/k/ as in cat

/d/ as in day

/f/ as in four

g equals /g/ as in go
/dz/ as in page

/h/ as in he

j equals /dz/ as in jail

/k/ as in kick

/l/ as in Cola

/m/ as in man

/n/ as in man

/p/ as in Dr. Pepper

qu equals /kw/ as in quit

/r/ as in run

/s/ as in sun

/t/ as in ten

/v/ as in van

/w/ as in woman

/x/ as in extra

/y/ as in yet (sometimes /ē/ as in many)

/z/ as in zebra

/sh/ as in shut

/ch/ as in church

/ng/ as in sing

/th/ (voiced) as in this

/th/ (unvoiced) as in thing

oo equals /ū/ as in food
/u/ as in good

LANGUAGE PAGE صفحة لغـــة

1. voltage (vōl'tij)
electric potential or potential difference expressed in volts

١ ـ جهد
جهد كهربائي او فرق جهد معبر عنه بالفلط

2. current (ker'ent)
flow of electrons expressed in a rate of flow as amperes

٢ ـ تيار
دفق كهيربات يعبر عنه بمعدل دفق يسمى أمبير .

3. resistance (re zis'tans)
the opposition offered by a substance to the movement of electrons

٣ ـ مقاومة
الاعتراض الذي تظهره المادة لحركة الكهيربات

4. power (pou'er)
force or energy applied to work

٤ ـ قدرة
قوة او طاقة مطبقة في العمل .

5. ampere (am'per)
the unit of measure for current

٥ ـ أمبير
وحدة قياس التيار

6. volt (vōlt)
the unit of measure of voltage

٦ ـ فلط
وحدة قياس الجهد

7. ohm (ōm)
the unit of measure of resistance

٧ ـ أوم
وحدة قياس المقاومة

8. watt (wot)
the unit of measure for electrical power

٨ ـ واط
وحدة قياس القدرة الكهربائية

9. electron (e lek' tron)
part of an atom with a negative charge that can be moved with little effort

٩ ـ الكهيرب
جزء من الذرة ،سالب الشحنة ،يمكن تحريكه بمجهود قليل .

LANGUAGE PAGE (continued) صفحة لغة (يتبع)

10. proton (prō'ton)
part of an atom with a positive charge that has weight and is hard to move

١٠- بروتون
جزء من الذرة ،موجب الشحنة ، له وزن ،وصعب الحركة .

11. atom (at'um)
the smallest particle of an element

١١- ذرّة
الجزيء الاصغر في العنصر

12. neutron (nū'tron)
part of an atom with no electrical charge

١٢- نيوترون
جزء من الذرة بدون شحنة كهربائية

13. molecule (mol'e kiul)
the smallest portion of an element or compound that still holds its identification

١٣- جسيم (جزيء)
اصغر جزء في العنصر او في المركب الكيماوي والذي لايزال يحتفظ بهويته .

14. element (el'e ment)
basic part of all material

١٤- عنصر
جزء اساسي لكل مادة

15. static (stat'ik)
stationary charge of electricity

١٥- ساكن
شحنة كهربائية ساكنة

16. coulomb (koo'lom)
a large amount of electric charge or electrons

١٦- كولوم
كمية كبيرة من شحنة كهربائية أو كهيربات

17. ion (ī' on)
an atom that has an electric charge

١٧- أيون
ذرة لها شحنة كهربائية

STUDENT ACTIVITY 1 تمرين الطالب رقم ١

Objective:

The student will identify and pronounce the terms used in the study of electricity so that the teacher understands what he is saying.

الهدف :

سوف يتعرف الطالب على العبارات المستعملة في دراسة الكهرباء وسيلفظها بحيث ان المعلم يفهم عليه ما يقول .

Directions:

From the language sheet go over the terms and their pronunciation until you can look at the term and say it fluently to the teacher.

تعليمات :

اعد دراسة العبارات وطرق لفظها على صفحة اللغة حتى يصير بمقدورك ان تقولها لاستاذك بطلاقة ،بمجرد النظر اليها .

If you have difficulty with some of these terms, get the specific language cards from the teacher. Go to the library and get the Bell and Howell Language Master machine. With the cards and the machine, practice saying each word after the machine pronounces the term. See the term on the card - say the word. Push repeat button down and the card will repeat the word. Get help from the librarian if needed.

اذا صادفت صعوبة مع بعض هذه العبارات ،خذ بطاقات اللغة الخاصة من معلمك. اذهب الى المكتبة واحصل على آلة "بيل وهاول للغة ،بواسطة البطاقات والآلة ، انظر الى العبارة على البطاقة والفظها . اضغط على زر الاعادة كي تعيد البطاقة الكلمة . اذا احتجت الى مساعدة اطلبها من امين المكتبة .

Practice these terms until you can identify and pronounce all the terms so the teacher can understand you.

تمرن على هذه العبارات حتى تقدر ان تتعرف عليها وتلفظها كلها بحيث يستطيع المعلم ان يفهمك .

STUDENT ACTIVITY 2 تمرين الطالب رقم ٢

Objective:
The student will put terms used in the study of electricity into sentences to the teacher's satisfaction.

الهدف
سوف يضع الطالب العبارات المستعملة في دراسة الكهرباء في جمل تحوز على رضى المعلم .

DIRECTIONS:
Complete the following sentences correctly using these words:

تعليمات
اكمل الجمل التالية بشكل صحيح مستعملاً الكلمات التالية :

1. electricity — ١ ـ كهرباء
2. voltage — ٢ ـ جهد
3. current — ٣ ـ تيار
4. power — ٤ ـ طاقة

A. Jihad said that _____ is a potential difference between two (2) points on a conducting wire.

أ ـ قال جهاد ان _____ هو فرق الجهد بين نقطتين على سلك موصّل .

B. Wael wanted six (6) amperes of _____ to flow in the circuit.

ب ـ يريد وائل ستة (٦) امبيرات من _____ كي تتدفق في الدائرة.

C. Detroit Edison is our electric _____ company.

ج ـ ديترويت اديسون هي شركتنا للـ _____ الكهربائية .

D. _____ is the study of electric motion and power.

د ـ _____ هو دراسة كهربة الحركة والقدرة .

STUDENT ACTIVITY 2 (continued) تمرين الطالب رقم ٢ (يتبع)

Self test: اختبار ذاتي

What are the terms that are described below?

ما هي العبارات الموصوفة أدناه ؟

_____:

flow of electrons expressed in a rate of flow as amperes.

_____ :

دفق الكترونات معبر عنه بامبيرات كمعدل دفق

_____:

force or energy applied to work.

_____ :

قوة او طاقة مطبقة على العمل

_____:

electric potential or potential difference expressed in volts.

_____ :

جهد كهربائي او فرق الجهد معبر عنه بالفلطات .

_____:

the opposition offered by a substance to the movement of electrons.

_____ :

الاعتراض الذي تبديه مادة لحركة الكهيربات سالبة الشحنة .

Refer to LANGUAGE PAGE if necessary.

ارجع الى صفحة اللغة اذا كان ذلك ضروريا "

STUDENT ACTIVITY 2 (continued)

DIRECTIONS:

Complete the following sentences correctly using these words:

الاهداف :

اكمل الجمل التالية باستعمال الكلمات التالية :

1. ampere — ١ - امبير
2. volt — ٢ - فلط
3. ohm — ٣ - الامْ
4. watt — ٤ - واط

A. Sam used 3 _____ of current to get his car radio to work.

استعمل سام ٣ _____ لتشغيل راديو سيارته .

B. A car radio used 12 _____ to operate according to Hisham.

يحتاج راديو السيارة الى ١٢ _____ كي يعمل .

C. Detroit Edison charges about 3 cents per thousand _____ of power.

انك تدفع حوالي ٣ سنتات مقابل كل الف _____ من الطاقة الى شركة ديترويت اديسن .

D. There is 1,200 _____ of resistance in the circuit.

يوجد حوالي ١،٢٠٠ _____ من المقاومة في الدائرة الكهربائية .

STUDENT ACTIVITY 2 (continued)

DIRECTIONS:

Complete the following sentences correctly using these words:

الاهداف :

اكمل الجمل التالية باستعمال الكلمات التالية :

1. ampere — ١ - امبير
2. volt — ٢ - فلط
3. ohm — ٣ - الأم
4. watt — ٤ - واط

A. Sam used 3 _____ of current to get his car radio to work.

استعمل سام ٣ _____ لتشغيل راديو سيارته .

B. A car radio used 12 _____ to operate according to Hisham.

يحتاج راديو السيارة الى ١٢ _____ كي يعمل .

C. Detroit Edison charges about 3 cents per thousand _____ of power.

انك تدفع حوالي ٣ سنتات مقابل كل الف _____ من الطاقة الى شركة ديترويت اديسن .

D. There is 1,200 _____ of resistance in the circuit.

يوجد حوالي ١٠٢٠٠ _____ من المقاومة في الدائرة الكهربائية .

STUDENT ACTIVITY 2 (continued) تمرين الطالب رقم ٢ (يتبع)

DIRECTIONS:

Complete the following sentences correctly using these words:

تعليمات

اكمل الجمل التالية بشكل صحيح مستعملاً هذه الكلمات .

1. electron
2. proton
3. atom
4. neutron

١ ـ كهيرب سالب الشحنة
٢ ـ بروتون
٣ ـ ذرة
٤ ـ نيوترون

A. A small part of an atom that has no charge is called a _____.

أ ـ جزء صغير من الذرة ،بدون شحنة يدعى : _____

B. Hissam likes the word _____ which is the positive part of the atom.

ب ـ يحب حسام الكلمة _____ والتي هي الجزء الموجب من الذرة

C. _____ has little weight and has a negative charge.

ج ـ _____ له وزن متناه في الصغر وشحنته سالبة .

D. All matter is made up of _____ and they are the smalledst particle of an element.

د ـ كل مادة مصنوعة من _____ وهي الاجزاء المتناهية في الصغر من العنصر .

STUDENT ACTIVITY 2 (continued)

Self test:

اختبار ذاتي :

Write the proper term for each of the following descriptions:

اكتب العبارة المناسبة لكل من المواصفات التالية :

_____:

the smallest particle of an element.

_____ :

الجزيء المتناهي في الصغر من العنصر .

_____:

part of an atom with a positive charge that has weight and is hard to move.

_____ :

جزء من ذرة ،موجب الشحنة ، له وزن،وصعب الحركة .

_____:

part of an atom with no electric charge.

_____ :

جزء من ذرة بدون شحنة كهربائية .

_____:

part of an atom with a negative charge that can be moved with little effort.

_____ :

جزء من ذرة ذوشحنة سالبة ، يمكن تحريكه بمجهود لا يذكر

Refer to LANGUAGE PAGE if necessary.

ارجع الى صفحة اللغة اذا كان ذلك ضروريا" .

STUDENT ACTIVITY 2 (continued)

DIRECTIONS:

Complete the following sentences correctly using these words:

تعليمات

اكمل الجمل التالية بشكل صحيح مستعملاً هذه الكلمات :

1. molecule
2. elements
3. static
4. coulomb

١ ـ جسيم
٢ ـ عناصر
٣ ـ ثابت
٤ ـ كولوم

A. Harry combined two elements to form a _____ .

أ ـ ضم "هاري" عنصرين ليؤلف _____ .

B. Sam learned in chemistry that all material can be broken into a limited number of _____.

ب ـ تعلم سام في الكيمياء انه يمكن تجزئة كل مادة لعدد محدود من الـ _____ .

C. Eric got a shock from _____ electricity after walking on a rug and then touching a metal chair.

ج ـ تلقى "اريك" صدمة كهربائية من الكهربائية _____ بعد سيره على سجادة ولمسه بعد ذلك كرسيا" معدنيا" .

D. Jim said that 6,280,000,000,000 is an awful large amount of electrons and should be called a _____.

د ـ قال "جيم" ان ٦٠٢٨٠٠٠٠٠٠٠٠٠٠٠ هو مقدار هائل من الكهربات السالبة يجب ان يدعى _____ .

STUDENT ACTIVITY 2 (continued)

Self test:

إختبار ذاتي

What are the terms that are described below:

ما هي العبارات الموصوفة أدناه :

_____:

the smallest portion of an element or compound that still holds its identification.

_____ :

هو الجزء الاصغر من عنصر او مركب والذي لا يزال يحتفظ بصفاته .

_____:

stationary charges of electricity.

_____ :

هي شحنات كهربائية ساكنة .

_____:

basic part of all material.

_____ :

هو جزء اساسي من كل مادة .

_____:

a large amount of electric charge or electrons.

_____ :

مقدار كبير من شحنة كهربائية او من كهيربات سالبة .

STUDENT ACTIVITY 3

Objective:

The student will improve his usage of terms used in the study of electricity by working them into common sentences.

الهدف :

سوف يحسّن الطالب من استعماله للعبارات المستعملة في دراسة الكهرباء بالعمل على ادخالها في جمل مفيدة .

DIRECTIONS:

Change the words around so that they form a sentence related to the study of electricity. Write the sentence in the space below the listed words.

تعليمات :

غير مواقع الكلمات بحيث تشكل جملة متعلقة بدراسة الكهرباء . اكتب الجملة في الفراغ تحت الكلمات المثبتة .

STUDENT ACTIVITY 3 (continued)

1. unit of measure volt the is a for voltage

وحدة قياس الفلط الجهد هو

2. Jim's circuit current three(3) of is flowing in

دائرة "جيم" التيار الكهربائي ثلاثة (٣) امبيرات من تدفق في

3. circuit to allow too much resistance in the there was it to work

الدائرة من ان تجعل اكبر المقاومة في كانت الدارة تعمل

4. power for supplies Detroit Edison the electric this area

الطاقة بـ تمون ديترويت اديسون الكهربائية هذه المنطقة .

What were the terms related to electricity that were used in the above statements?

ما هي العبارات التي تتعلق بالكهرباء التي استعملت في الفقرات اعلاه ؟

1._____ ١ - _____

2._____ ٢ - _____

3._____ ٣ - _____

4._____ ٤ - _____

STUDENT ACTIVITY 3 (continued)

5. there was of the circuit one part 5 volts across

٥ ـ كان هنالك من الدائرة واحد جزء ٥ فلطات على

6. flowing had a circuit six amperes that John produced

٦ ـ تدفق في دائرة ستة امبيرات جون ولّد

7. the higher the meter resistance read in ohms the higher the meter will

٧ ـ ازدادات كلما المقاومة العداد في ما يسجله بالاومات كلما ازداد العدد

8. for our electricity of usage we pay of watts by the thousands

٨ ـ لاجل الكهرباء استعمالنا ندفع بـ "الواطات" آلاف .

What were the terms related to electricity that were used in the above statements?

ما هي العبارات التي تتعلق بالكهرباء التي استعملت في الفقرات اعلاه

5._____ ـ ٥ _____

6._____ ـ ٦ _____

7._____ ـ ٧ _____

8._____ ـ ٨ _____

STUDENT ACTIVITY 3 (continued)

9. gained a charge a atom that has is called an ion

٩ – تكسب شحنة التي الذرة تدعى "ايونا"

10. one point to another and can be moved from has a negative charge an electron

١٠ – نقطة الى اخرى وبالسوسع تحريكه من ذو سالبة شحنة الكهيرب

11. a positive charge the proton atom part of an is called with

١١ – الموجبة الشحنة "بروتونا" الذرة الجزء من يدعى ذو

12. the neutron has no electric charge which of an atom is a part

١٢ – النيوترون بدون كهربائية شحنة من الذرة هو جزء

What were the terms related to electricity that were used in the above statements?

ما هي العبارات المتعلقة بالكهرباء التي استعملت في الفقرات اعلاه ؟

9._____

10._____

11._____

12._____

٩ – _____

١٠ – _____

١١ – _____

١٢ – _____

STUDENT ACTIVITY 3 (continued)

13. tiny particles all materials called molecules are made up of

١٣ - بالغة في الصغر جزئيات كل المواد تدعى جسيمات تتكون من

14. identity retain their the smallest parts elements are of a material that can

١٤ - بهويتها ان تحتفظ المتناهية في الصغر الاجزاء العناصر هي التي من المادة بوسعها

15. shock from a you can get quite a static charge

١٥ - صدمة من يمكن ان تتلقى تماما" ساكنة شحنه

16. to form a coulomb of electrons a large quantity it takes

لتكوين كولوم من الكهيربات سالبة الشحنة كبير مقدار يلزم

What were the terms related to electricity that were used in the above statements?

ما هي العبارات المتعلقة بالكهرباء والتي استعملت في الفقرات اعلاه .

13._____

١٣ - _____

14._____

١٤ - _____

15._____

١٥ - _____

16._____

١٦ - _____

PRETEST -- ANSWER SHEET

اختبار تمهيدي - ورقة جواب

1.	D	د	9.	J	ي
2.	A	أ	10.	L	ل
3.	C	ج	11.	I	ط
4.	B	ب	12.	K	ك
5.	F	و	13.	M	م
6.	E	هـ	14.	N	ن
7.	G	ز	15.	O	س
8.	H	ح	16.	P	ع

STUDENT ACTIVITY 2 -- ANSWER SHEET

Page 8	Page 10	Page 12	Page 14
A. voltage	A. amperes	A. neutron	A. molecule
B. current	B. volts	B. proton	B. elements
C. power	C. watts	C. electron	C. static
D. electricity	D. ohm	D. atoms	D. coulomb

Self Test:

Page 9	Page 11	Page 13	Page 15
A. current	A. watt	A. atom	A. molecule
B. power	B. ohm	B. proton	B. static
C. voltage	C. volt	C. neutron	C. element
D. resistance	D. ampere	D. electron	D. coulomb

STUDENT ACTIVITY 3 -- ANSWER SHEET

1. The unit of measure for voltage is the volt.
2. Three (3) amperes of current is flowing in Jim's circuit.
3. There was too much resistance in the circuit to allow it to work.
4. Detroit Edison supplies the electric power in this area.

1. voltage 2. amperes 3. resistance 4. power

5. There was 5 volts across one part of the circuit.
6. John produced six amperes flowing in a circuit.
7. The higher the resistance in the meter, the higher the meter will read.
8. We pay for the usage of our electricity by the thousands of watts.

5. volts 6. amperes 8. resistance 8. watts

9. An atom that has gained a charge is call an ion.
10. An electron can be moved from one point to another and has a negative charge.
11. The part of an atom with a positive charge is called a proton.
12. The part of an atom which has no electrical charge is the neutron.

9. ion 10. electron 11. proton 12. neutron

13. All materials are made up of tiny particles called molecules.
14. Elements are the smallest parts of a material that can retain their identity.
15. You can get quite a shock from a static charge.
16. It takes a large quantity of electrons to form a coulomb.

13. molecules 14. elements 15. static 16. coulomb

اختيار تمهيدي ـ ـ ورقة جواب

١ صفحة	٢ صفحة	٣ صفحة	٤ صفحة
أ ـ جهـــد	أ ـ امبيرات	أ ـ نيوترون	أ ـ جسيم
ب ـ تيار	ب ـ فولطات	ب ـ بروتون	ب ـ عناصر
ج ـ قدرة	ج ـ واطات	ج ـ كهيرب سالب	ج ـ ساكن
د ـ كهرباء	د ـ أوم	د ـ ذرات	د ـ كولوم

اختبر نفسك

أ ـ تيـــار	أ ـ واط	أ ـ ذرة	أ ـ جسيم
ب ـ قدرة	ب ـ اوم	ب ـ بروتون	ب ـ ساكن
ج ـ جهد	ج ـ فولط	ج ـ نيوترون	ج ـ عنصر
د ـ مقاومة	د ـ امبير	د ـ كهيرب سالب	د ـ كولوم